

# Analyse de Fourier, analyse harmonique abstraite

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V.A. KOZLOV, V.G. MAZ'YA, J. ROSSMANN. — **Elliptic boundary value problems in domains with point singularities.** — Mathematical surveys and monographs, vol. 52. — Un vol. relié, 18,5×26, de IX, 414 p. — ISBN 0-8218-0754-4. — Prix: £70.00. — American Mathematical Society, Providence, distributed by Oxford University Press, Oxford, 1998.

This monograph systematically treats a theory of elliptic boundary value problems in domains without singularities and in domains with conical or cuspidal points. This exposition is self-contained and a priori requires only basic knowledge of functional analysis. Restricting to boundary value problems formed by differential operators and avoiding the use of pseudo-differential operators makes the book accessible for a wider readership. The authors concentrate on fundamental results of the theory. A special feature of the book is that the solutions of the boundary value problems are considered in Sobolev spaces of both positive and negative orders.

Maria MASCARELLO, Luigi RODINO. — **Partial differential equations with multiple characteristics.** — Mathematical topics, vol. 13. — Un vol. relié, 17,5×24,5, de 352 p. — ISBN 3-05-501764-1. — Prix: DM 148.00. — Akademie Verlag, Berlin, Wiley-VCH, Weinheim, 1997.

The book is devoted to the general theory of partial differential equations with multiple characteristics. The method of microlocal analysis are reviewed and used to prove recent results on local solvability, hypoellipticity, propagation of singularities in the frame of Sobolev spaces, Schwartz distributions, and Gevrey ultradistributions. The Cauchy problem is also considered.

Peter R. POPIVANOV, Dian K. PALAGACHEV. — **The degenerate oblique derivative problem for elliptic and parabolic equations.** — Mathematical research, vol. 93. — Un vol. broché, 17×24, de 153 p. — ISBN 3-05-501757-9. — Prix: DM 78.00. — Akademie Verlag, Berlin, 1997.

The authors investigate the degenerate (tangential) oblique derivative problem for linear and semilinear second order elliptic and parabolic operators. They propose at first a survey on the linear degenerate oblique derivative problem including central results on the subject, as well as subelliptic estimates in Sobolev and Hölder classes. Theorems on existence, uniqueness and regularity of the classical solutions to the tangential oblique derivative problem for semilinear elliptic and parabolic equations are proved more detailed.

Karen YAGDJIAN. — **The Cauchy problem for hyperbolic operators: multiple characteristics; micro-local approach.** — Mathematical topics, vol. 12. — Un vol. relié, 18×24,5, de 397 p. — ISBN 3-05-501739-0. — Prix: DM 130.00. — Akademie Verlag, Berlin, 1997.

The goal of this book is a construction of the fundamental solution to the Cauchy problem for hyperbolic operators with multiple characteristics. Well-posedness of the problem in various functional spaces as well as a propagation of singularities of the solutions are investigated, too. For operators with multiple characteristics so called Levi conditions play a crucial rôle. Described in the book Levi conditions allow to carry out the construction of fundamental solutions. The approach represented in the book is essentially based on the zeros of the complete symbol of the operator.

## *Analyse de Fourier, analyse harmonique abstraite*

C.E. D'ATELLIS, E.M. FERNÁNDEZ-BERDAGUER. — **Wavelet theory and harmonic analysis in applied sciences.** — Applied and numerical harmonic analysis. — Un vol. relié, 16,5×24, de XVIII, 345 p. — ISBN 0-8176-3953-5. — Prix: SFr. 138.00. — Birkhäuser, Boston, 1997.

This book contains 12 invited chapters addressing applications and interactions between wavelet theory and scientific, medical and geophysical problems. Topics covered include EGG

signals, spectral analysis, wavelet transform from orthogonal spline wavelets, numerical modeling of Maxwell's equation, wavelet networks and nonlinear processes. It is addressed to an interdisciplinary readership of professional workers in applied mathematics, electrical engineers, physicists and other scientists interested in applying these new ideas and techniques.

Hans G. FEICHTINGER, Thomas STROHMER, (EDITORS). — **Gabor analysis and algorithms: theory and applications.** — Applied and numerical harmonic analysis. — Un vol. relié, 16 × 24, de XVI, 496 p. — ISBN 0-8176-3959-4. — Prix: SFr. 118.00. — Birkhäuser, Boston, 1998.

This book is a definitive survey of the subject showing the connections and interactions between theory, numerical algorithms, and applications. The first part of the book is devoted to the mathematical foundations of Gabor analysis, including Weyl-Heisenberg frames, duality conditions, the uncertainty principle, and the Balian-Low-Theorem as well as a group theoretical approach. The second part presents numerical algorithms and selected applications in signal and image processing.

W. FREEDEN, T. GERVEN, M. SCHREINER. — **Constructive approximation on the sphere: with applications to geomathematics.** — Numerical mathematics and scientific computation. — Un vol. relié, 15,5 × 24,5, de XV, 427 p. — ISBN 0-19-853682-8. — Prix: £65.00. — Clarendon Press, Oxford, 1998.

The subject of geomathematics focuses on the interpretation and classification of data from geoscientific and satellite sources, reducing information to a comprehensible form that allows for the testing of concepts and the solution of problems. The book bridges the existing gap between monographs on the special functions of mathematical physics and constructive approximation in Euclidean spaces. The primary objective is to provide readers with an understanding of aspects of approximation by spherical harmonics, such as spherical splines and wavelets, as well as indicating future directions of research. Scalar, vectorial, and tensorial methods are each considered in turn.

## *Analyse fonctionnelle et théorie des opérateurs*

Daniel ALPAY, Aad DIJKSMA, James ROVNYAK, Hendrik de SNOO. — **Schur functions, operator colligations, and reproducing kernel Pontryagin spaces.** — Operator theory: advances and applications, vol. 96. — Un vol. relié, 17,5 × 24, de XI, 229 p. — ISBN 3-7643-5763-0. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1997.

This book develops the realization theory of generalized Schur functions as characteristic functions of coisometric, isometric, and unitary colligations whose state spaces are reproducing kernel Pontryagin spaces. This provides a modern system theory setting for the relationship between invariant subspaces and factorization, operator models, Krein-Langer factorizations, and other topics. An introductory chapter supplies background material, including reproducing kernel Pontryagin spaces, complementary spaces in the sense of de Branges, and a key result on defining operators as closures of linear relations.

Shavkat AYUPOV, Abdugafur RAKHIMOV and Shukhrat USMANOV. — **Jordan, real and Lie structures in operator algebras.** — Mathematics and its applications, vol. 418. — Un vol. relié, 16,5 × 24,5, de IX, 225 p. — ISBN 0-7923-4684-X. — Prix: Dfl. 340.00. — Kluwer Academic Publishers, Dordrecht, 1997.

The first purpose of the book is to study the deep structure theory for Jordan operator algebras similar to (complex) von Neumann algebras theory, such as type classification, traces,